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Change 1
30 September 1966

Project Headquarters Manual
50-3055-8

General Instructions

1. Project Headquarters Manual, 50-3055-8, dated 15 June 1966,
is changed as follows:

List of Affected Pages

Chapter I

Pages I-5, I-6, I-7, I-8

Chapter II

Pages II-3, II-4, II-5, II-6, II-7, II-8

Chapter III

Pages III-11, III-12, III-23, III-24

Chapter IV

Pages IV-1, IV-2

Chapter V

Pages VI-1, VI-2, VI-3, VI-4, VI-9, VI-10

2. Remove old pages and insert new pages. Old pages will be
destroyed IAW AFM 205-1. Certificate of destruction is required.

3. This sheet may be destroyed after posting changes on "Record
of Revision/Amendments" page of Manual.

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4. DEFINITIONS:

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- a. [REDACTED] - An electronic monitoring system with data link from the aircraft to ground station by means of HF radio.
- b. Denied Territory - Those geographical areas controlled by governments unfriendly to the U.S., or are members of the Communist Bloc. Any other geographical areas from which photographic or electronic intelligence must be obtained without permission of the controlling government.
- c. Departure Route - That portion of the mission beginning at the departure base and ending at the end air refueling point, prior to penetration of denied territory. Departure route will not be defined for missions which do not include air refueling prior to penetration of denied territory.
- d. Deployed Task Force (DTF) - Aircraft and required supporting equipment and personnel; under command of a Deployed Task Force Commander (DTFC), capable of performing operational missions from a forward location as directed by Project Headquarters.
- e. Early Warning Line - A line which depicts the approximate maximum distance at which an aircraft comes under active radar surveillance based on the best early warning capability estimate of hostile radar systems.

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(1) High EW Line - The High Early Warning Line is defined as a line extending approximately 350 NM from an active radar site for aircraft flying above 75,000 feet.

(2) Low EW Line - The Low Early Warning Line is defined as a line extending approximately 250 NM from an active radar site for aircraft flying at 35,000 feet.

(3) Early Warning Capability will vary (i. e., greater in USSR, possibly less in other countries). Distances to be used will be provided by Project Headquarters on a recurring basis.

f. Flight Line - Track designed to allow photographic coverage of selected target areas without change of course.

g. Friendly Territory - Those geographical areas controlled by governments friendly to the U. S. from whom diplomatic approval has been obtained for landing/take-off permission for the A-12 and/or supporting KC-135 tankers.

h. Fuel Decision Points - Those points along the route at which the fuel remaining will dictate whether or not the mission can be completed as planned.

i. Local Defense Area - An area around any target or complex which is defended by anti-aircraft weapons and/or surface to air missiles.

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j. Neutral Territory - Those geographical areas controlled by governments either friendly to the U. S. or not associated with the Communist Bloc; but from whom diplomatic clearance has not, or cannot, be obtained for landing/takeoff permission for the A-12 and/or supporting KC-135 tankers.

k. Passive Detection Line (PDL) - A line located that distance from a monitoring ground site at which airborne electronic emissions may be detected by the enemy and could result in the premature alerting of the hostile defense net.

l. Penetration Route - That portion of the mission which includes the overflight of denied territory. The penetration route may start at the departure base or at the end of the refueling prior to the overflight, and terminate at either the post-strike base or at the end of the post-strike refueling. The penetration leg refueling will include route(s) to missed AR post strike bases.

m. Point of Safe Return (PSR) - That point on the planned route at which a turn is initiated (considering fuel used in performing the turn) that will enable the aircraft to return to missed AR alternate or home base with planned minimum fuel reserve.

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n. Withdrawal Route - That portion of the mission which commences at the end of any penetration route and terminates at the planned post-strike base.

o. Signal Conditioner Data Monitor (SCDM) - Electronic means of recording, (in digital form) navigational and SIP data as related to time along the mission route.

p. Special Intercept Package (SIP) - An airborne electronic system which records electronic signals received on pre-selected frequencies.

q. Specifications Check (Spec Check) - Method of determining, by means of a ground fix, whether the Inertial Navigation System is within operating limits for that particular mission.

r. Sun Angle - (Minimum) - Angle of the sun above the horizon at which acceptable visual photography may be accomplished. (Minimum being 15 degrees).

5. RESPONSIBILITIES:

a. Project Headquarters is responsible for:

(1) Publication/distribution of this manual.

(2) Coordination with [REDACTED] on revisions to this manual.

(3) Insuring Key Staff (as determined by Director, Special Activities) and Flight Planning Personnel maintain intimate knowledge of contents of this manual.

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tanker to reposition at the ARCP. Project Headquarters will determine the air spare turn-around point, based on minimum fuel required to return to launch base.

f. Departure Route: All necessary take-off data will be incorporated in the departure route. Current performance data will be utilized to compute: take-off and climb fuel, speed, distance, and level off altitude. Departure routes may be planned either subsonic or supersonic. Normally, operational departure routes will be pre-planned prior to mission generation. When feasible, a primary and back-up INS Spec Check fix point will be selected and annotated. No portion of the departure route will penetrate the hostile EW Line.

g. Penetration Route: The minimum penetration altitude/speed will be determined by Project Headquarters for each mission and will be disseminated by appropriate mission plan message. If the pilot is unable to attain/maintain the specified minimum penetration altitude/speed prior to the planned penetration point or is unable to attain/maintain the minimum penetration altitude/speed while over denied area, the mission will be aborted. (See Chapter VI for abort criteria). Routes will be planned to provide for maximum target coverage commensurate with SAM avoidance and mission requirements. Flight lines will be planned to

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commence a minimum of 30 NM prior to and continue a minimum of 30 NM beyond the designated target complex to insure desired photographic coverage. Flight lines will be planned a sufficient distance beyond turning points to insure proper stabilization during the flight line. INS points will be programmed as required to insure stability during flight line portion of route.

(1) On daylight photo-missions, timing will be predicated upon a sun angle of 30° over designated targets. If this condition cannot be met, a minimum sun angle of 15° will be mandatory for acceptable photography.

(2) INS Considerations: When Mission Profile permits, a Spec Check fix will be planned prior to overflight of denied territory. Mandatory INS positions are required as follows:

- (a) Denied territory penetration point.
- (b) Points as outlined in paragraph g above.
- (c) Air Refueling Control Point.
- (d) End Air Refueling Point.
- (e) Primary Missed Air Refueling Alternates.
- (f) Post-Strike Base and as many Emergency Alternates as INS position capability permits.

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(g) Turn Points.

(h) Exit denied territory.

NOTE: Items (c), (d) and (e) above are only applicable
when air refueling is planned.

h. Withdrawal Route: Withdrawal route(s) will be planned so as not
to penetrate hostile early warning radar areas.

i. Project Headquarters will identify the following single engine
points for each operational overflight mission:

(1) Single Engine Safe Return (SESR): The farthest point on
penetration route at which aircraft can lose an engine and return to
briefed base with sufficient fuel remaining to complete initial pene-
tration and arrive at missed approach point with 5000 lbs of fuel.

(2) Single Engine Safe to Continue (SESC): That point on the pene-
tration route beyond which the aircraft can continue to briefed base
on one engine with sufficient fuel remaining to complete initial pene-
tration and arrive at missed approach point with 5000 lbs of fuel.

(3) Single Engine Point of No Return (SEPNR): That point along
the penetration route, using single engine performance, beyond
which the aircraft can no longer exit to a point 12 miles outside
denied territory.

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(4) Single Engine Point to Continue (SEPC): That point along the penetration route where the aircraft, using single engine performance can exit to a point 12 miles outside denied territory.

NOTE: The portion of the penetration route between points

(3) SEPNR, and (4) SEPC above, is defined as the Single Engine Area of No Return. Over this portion of the penetration route the aircraft, using the most direct route, can no longer exit to a point 12 miles outside denied territory.

3. EXECUTION:

a. Radio Silence: Radio discipline is mandatory on all operational missions; only those communications authorized in specific Operations Plans will be made.

b. Systems Operation:

(1) Cameras: When over denied territory, all cameras will be operated continuously within the limitations of the film available. Project Headquarters will furnish specific instructions for each mission.

(2) Special Intercept Package: Point at which SIP will be turned on will be indicated on pilot map and operated continuously within the limitations of the tape package available.

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(3) [REDACTED] Electronic Monitoring

System will be used throughout entire operational mission. Pre-

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penetration [REDACTED] Check will be completed prior to reaching a point 100 NM from denied territory.

(4) Inertial Navigation System: This system will be used as the primary means of navigation.

(5) Destruct System: Project Headquarters will direct use of water soluble maps and destruct systems as required.

c. Escape and Evasion: Specific escape and evasion instructions will be transmitted by Project Headquarters Intelligence Division for Operational Missions.

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- (7) Air refueling abort point.
- (8) Completion point.
- (9) Alternate air refueling control point
(if applicable).
- (10) Alternate air refueling track (if applicable)
- (11) Number of receivers and tankers.
- (12) Tanker and receiver call signs.
- (13) Recovery and emergency bases.
- (14) Standby tanker requirements.
- (15) Cell or individual tactics.
- (16) Rendezvous/air refueling frequencies
(UHF and HF).
- (17) AN/ARC-50 receiver-transmitter and range address
selector settings.
- (18) Fuel transfer requirements.
- (19) Air traffic control clearance limits.
- (20) Receiver's INS check points (Buddy cruise only).
- (22) Receiver's departure heading after refueling completion.
- (23) Bingo Fuel.

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f. Before take-off all tankers and receiver flight crews will be thoroughly briefed and will receive flimsies on data pertinent to the rendezvous and air refueling.

5. OPERATIONAL PLANS: Appropriate operations plans/orders will be published to cover all operational missions. The organization responsible for obtaining required air route traffic control/restricted area clearances will be designated.

6. WEATHER: Normal minimum visibility for a rendezvous with automatic DME and relative bearing indicator functioning is one mile and turbulence not in excess of "moderate" intensity. Normal minimum visibility for a rendezvous without a functioning automatic DME or relative bearing indicator is five miles. Variations from the above minima will be reflected in the appropriate Project Headquarters OPLANS. After the receiver is in contact position these visibility restrictions no longer apply. It is imperative that a close "met" watch be maintained throughout an operation to aid in making recalls, diversions, etc., if unexpected weather conditions critical to the operation occur.

7. FUEL MINIMUMS: For deployment operations, missions will be planned so that the receiver will depart the penetration fix (20,000 feet) at the abort or destination base with a minimum of 7500 pounds of fuel remaining. If an alternate airfield is required, fuel minimums will be as specified in pertinent directives.

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(15) Receiver joins in the "observation" position and requests tanker to go "internal and position 2" (Both receiver and tanker select internal and reduce AN/ARC-50 power to position 2). Receiver pilot will give the INS read-out in latitude and longitude to the tanker navigator. This information may be used by tanker navigator to determine accuracy of ARCP and to assist in accurate end A/R INS position for receiver. Receiver then moves into the pre-contact position.

d. Alternate Rendezvous Procedure: (AN/ARC-50 internal function for UHF homing and voice, TACAN DME, tanker ARA/25 UHF homer). Except for equipment utilization alternates, rendezvous procedures are the same as for a normal rendezvous.

(1) If the external mode of the AN/ARC-50 radio is inoperative, rendezvous can be accomplished using the internal mode for voice communications and UHF homing, and the TACAN for DME. When automatic DME contact has not been made by 400 NM or ARCT minus 15 minutes, the receiver should attempt voice contact in external. If unable to establish contact, the receiver should select internal and attempt contact. If unsuccessful, call the tanker on the secondary air refueling frequency and request an alternate type rendezvous.

NOTE: The tanker will be monitoring the primary frequency on the ARC-50 in the "external" mode and will be unable to receive

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a call on "internal" unless the secondary frequency is used.

Tanker will monitor the secondary refueling frequency on the backup radio (AN/ARC-34). The HF radio may be used to establish contact if all attempts at UHF utilization fail.

(2) Receiver compares TACAN DME with INS distance to go.

(3) Receiver requests steady carrier for homing at 150 NM

(4) Tanker replies "Standby for carrier" and depresses mike button for 15 seconds. The tanker continues to transmit for 15 second periods at one minute intervals to provide homing singals until visual contact is established. The receiver will be alerted before each 15 second period and each call will be ended with the tanker call sign. Additional calls may be required.

NOTE: If the receiver's UHF/ADF function is inoperative, the procedure may be reversed with the receiver transmitting for steers and the tanker replying with magnetic bearings.

(5) Receiver will utilize the INS azimuth and DTG as the primary navigation reference until level off 20 NM up stream from the ARCP, then home on the tanker until visual contact is established.

NOTE: After reaching 100 NM DTG, the receiver will maintain an ADF reading on tanker of approximately 5° off center

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CHAPTER IV

NAVIGATION

(PART I)

1. GENERAL:

a. The inertial navigation system will be the primary means of navigation. In addition, all available equipment and techniques will be used to supplement this system. Accuracy of the INS should be verified, whenever possible, by reference to ground, radio navigation aids, and by means of tanker reports during refueling; however, information obtained by these means will not be used to update the INS. Updating will be accomplished on known visual ground fix points only.

b. The pilot will make every effort to complete Spec Check prior to penetration as required; however, if a Spec Check cannot be accomplished because of weather or other existing conditions, and the INS is functioning properly, the mission will be continued.

c. In the event of failure of the INS, the pilot will use all available navigation aids, consistent with the maintenance of mission security.

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Penetration of denied territory will not be attempted with INS which is inoperative or has a malfunction, which in the pilot's judgement would preclude successful completion of the mission.

d. A projector map strip/emergency map will be the primary means of flight following. Emergency maps will be used as back-up in the event of failure of the projector.

e. Refer to chapter three for detailed rendezvous and refueling procedures.

f. All planning is based on a max bank angle of 30° . In the event a manual turn is required, the pilot will attempt to maintain a 30° bank angle.

2. TAKE-OFF, CLIMB AND ENROUTE CELL:

a. Take-off: Take-off timing for operational missions will be in accordance with Project Headquarters "H" Hour Generation Timing. Every effort will be made to meet the scheduled take-off time. For each operational mission Project Headquarters will state the maximum acceptable time for take-off delay. This interval will be based on existing and enroute weather, tanker loiter capability, minimum acceptable target sun angle for visual photography, and any other factors which may be pertinent to a specific operation.

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CHAPTER VI

MISSION ABORT FACTORS

1. Purpose: The purpose of this chapter is to provide guidance to aircrews and operation staff personnel regarding the action to be taken when adverse conditions arise after take-off for an operational mission. Although the following procedures are intended for operational missions involving overflight of "sensitive" or "denied areas", applicable portions of these procedures should be observed during simulated operational missions over friendly territory for training purposes.
2. General: This analysis of abort factors is based on the assumption that mission urgency will not prohibit a 24 to 72 hour delay and that operational capability will permit substitution of a fully operational aircraft within this same 24 to 72 hour period. Accordingly, any failure or significant malfunction of a major aircraft system before entering the sensitive area will result in mission abort. After sensitive area penetration, planned route will be maintained unless a condition occurs which jeopardizes safety of flight or results in a significant increase in vulnerability to opposing defense systems.

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- a. Unless specified to the contrary by Project Headquarters abort criteria before entering sensitive area is mandatory and the pilot has no option except to abort. Planned recovery bases will be utilized whenever possible, but the pilot will make the final decision regarding where to land the aircraft based on the nature of the discrepancy, existing weather conditions, multiple malfunction, fuel reserves, etc.
- b. Abort criteria for "INSIDE SENSITIVE AREA" establishes the best course of action under most circumstances. Variable weather conditions, multiple malfunctions, opposing defense capabilities or reduced fuel reserves may necessitate other courses of action. The pilot will make the final decision based on pre-flight briefing information and his analysis of the existing situation.
- c. This criteria is not intended to deny the pilot the prerogative of aborting anytime the situation warrants.
- d. If the A-12 is forced to abort a mission, an abort report will be transmitted if the situation permits.

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The abort report, (whether transmitted via UHF or HFSSB) will consist of a two digit meaningful number followed by the minutes past the current ZULU hour. Numbers used indicating reason for abort will be as follows:

<u>NUMBER</u>	<u>MEANING</u>
11	Aircraft (includes all Systems/ Equipment)
12	Payload (Camera Sys, Etc.)
13	Pilot (Physical Cond., suit, Etc.)
14	Weather
15	Recalled

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RECOMMENDED ACTION

MALFUNCTION

SIGNIFICANCE

OUTSIDE SENSITIVE AREA

INSIDE SENSITIVE AREA

Engine Failure

Decrease in speed, altitude and range. Increased vulnerability to opposing defenses.

Abort. Land at nearest suitable alternate except in specifically denied neutral or unfriendly countries. In flight refueling will not be conducted except for fuel emergency.

Abort. Depart sensitive area ASAP by safest withdrawal route, use best applicable briefed option.

Afterburner Failure

Decrease in speed, altitude and range. Increased vulnerability to opposing defenses.

Abort. Recover at departure base or designated recovery base.

Abort. Depart sensitive area by safest withdrawal route, using best applicable briefed option.

Air Inlet Unstable

Possible decreases in speed, altitude range. Increased vulnerability to opposing defenses.

Repeated unstarts are grounds for abort. Recover at departure or designated recovery base. Necessity to operate inlets in manual is a mandatory abort.

Continue provided minimum penetration altitude can be maintained. Depart by safest withdrawal route if unable to maintain safe speed and altitude.

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<u>MALFUNCTION</u>	<u>SIGNIFICANCE</u>	<u>OUTSIDE SENSITIVE AREA</u>	<u>INSIDE SENSITIVE AREA</u>
SSB HF Failure 25X1A	Loss of [REDACTED]	<u>Abort.</u> Recover at departure base or designated recovery base.	Continue mission.
25X1A [REDACTED]	[REDACTED] and long range commo.		
[REDACTED]	Loss of ground monitor.	<u>Abort.</u> Recover at departure base or designated recovery base.	Continue mission.
EWS Failure	Increased vulnerability to opposing defenses.	<u>Abort.</u> Recover at departure base or designated recovery base.	Continue mission.
Normal Refueling System Inoperative	Refueling possible only through manual boom latching.	Continue mission.	Continue mission.
Inability to maintain Min Penetration Altitude/Speed	Increased vulnerability to opposing defenses.	<u>Abort.</u> Recover at departure base or designated recovery base.	<u>Abort.</u> Depart sensitive area by safest withdrawal route, using best applicable briefed option.
Presence of Contrails	Increased vulnerability through sighting and tracking by opposing forces.	Not applicable.	Continue mission unless contrails are specified as an abort item by Project Headquarters.

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MALFUNCTION

SIGNIFICANCE

OUTSIDE SENSITIVE AREA

INSIDE SENSITIVE AREA

Single Inverter
Failure

Loss of backup
inverter power
(#3 INS Fails)

Abort. Recover at departure
base or designated recovery base.

Continue mission.

Double Inverter
Failure

Loss of INS or
Package will result;
partial loss of SAS.

Abort. Recover at departure base
or designated recovery base.

Abort. Depart Sensitive area
by safest withdrawal route,
using best applicable briefed
option.

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